(19) Europäisches Patentamt
European Patent Office
Office uropéen des brevets

(11) EP 0 908 177 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
14.04.1999 Bulletin 1999/15

(51) Int. Cl.[6]: **A61K 9/50**, A61K 31/55

(21) Application number: **98500202.1**

(22) Date of filing: **11.09.1998**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **12.09.1997 AR 1004185**

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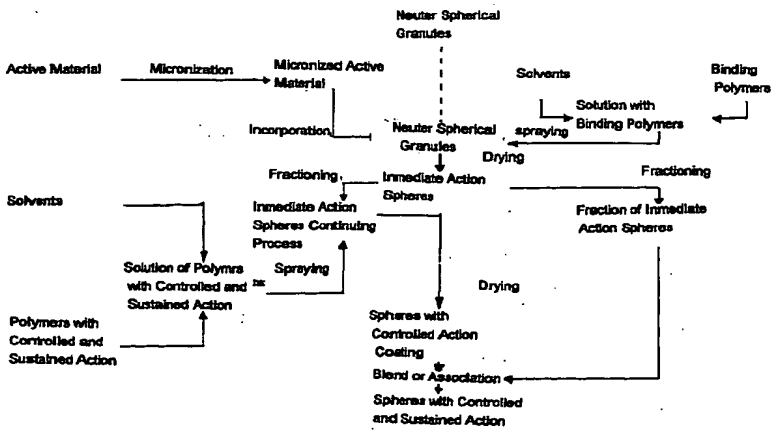
(54) Procedure to form pharmaceutical compositions in spherical pills or granules of controlled and sustained action that contain as active agent Bromazepam and pharmaceutical compositions obtained by said procedure

(57) This invention relates to a procedure to form pharmaceutical compositions in substantially spherical pills or granules with controlled and sustained action, having the 7-bromo-1,3-dihydro-5(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one), as active agent, and to pharmaceutical compositions obtained thrugh such procedure, said procedure consisting of following stages:

a) coating of nodules or nuclei formed by particles of sugar consolidated with starch, in an operation of blending of said nodules with micronized Bromazepan and a bonding polymer in solution, to form a biodegradable coating on said nodules, which retains the micronized material, forming the group of coated nodules, a first formulation, of quick release of Bromazepan;

b) forming on at least one separated fraction of the liberation nodules coming from stage a) a second coating, in an operation of blending of said fraction with a film-forming eutherical polymer in solution forming said fraction provided of this euterical coating in solution, a second formulation, of slow release;

c) combining enough quantities of formulations of Bromazepan of quick release and of slow or sustained release formed in the stages a) and b), to form compositions that contain predetermined doses and of programmed release of Bromazepan.



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Description

Scope of the invention

[0001] The present invention is related to a composition of substantially spherical granules or pills of controlled and sustained action, capable to maintain clinically acceptable therapeutic levels of 7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodicacepin-2(1H)-one Bromazepan) with a single daily dose, enough to form stable plasmatic concentrations and effective levels during twenty-four hours.

[0002] The mentioned compound (7-bromo-1,3-dihydro-5-(2-pyridinyl) -2H-1,4-benzodiacepin-2(1H)-one) is at the moment used in medications in their conventional, quick or immediate forms, for the treatment of emotional disorders whose symptomatology is expressed by means of states of anxiety, anguish, obsession, compulsions, phobias and hypochondrias, as it has positive effects on the psychic stresses, anxiety, nervousness and it also has sedative and myorelaxant properties. A procedure to prepare said composition is also proposed.

Background of the Invention

[0003] Bromazepan or 7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one) is known as from 1962, Belgian Patent N° 619.101 (1962), U.S. Patent N° 3.100.770 (1963), N° 3.182.065 and N° 3.182.067 (1964).

[0004] In these documents Bromazepan and analogue compounds are described, as well as the preparation of the same and their application for the treatment of altered emotional states, by means of pharmaceutical formulations of conventional or quick action doses of 1,5 mg, 3mg, and 6 mg.

[0005] In the world market there exist a great variety of pharmaceutical compositions of controlled and sustained action in granulated form or pills. Within this diversity there are certain suitable products for the treatment of emotional disorders that are advantageous, because they allow to have medicines of controlled and sustained action with which the number of daily doses is reduced, thus offering a greater safety and effectiveness and additionally therapeutic levels during longer periods, just as it happens for example with the dipotasic chlorazepate, diazepam, etc. administered in doses of controlled and sustained release.

[0006] In this aspect, it has been seen now that it is possible to prepare pharmaceutical compositions of controlled and sustained effects advantageously, which are particularly apt for the treatment of altered psychic states, related or associated with disorders or emotional flaws, by means of a treatment that implies the administration of formulations that have different release levels in vivo of Bromazepan - specifically a quick release and another of slow but sustained release - with which serious sustained and constant but long levels are obtained that in practices it means a better and more constant bioavailavility of Bramazepan with a smaller number of daily doses.

Description of the invention

[0007] According with the present invention, compositions of controlled and sustained action formed by pills or substantially spherical granules that contain (7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2 (1H) -one) (active agent) that are released in a sustained way maintaining stable plasmatic concentrations, are proposed.

[0008] Said compositions contain (7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one) including spherical granules (indistinctly mentioned hereinafter) as nodules or neuter (made up of sugar and starch), formed by following steps:

1. The incorporation of the micronized active agent on the nodules or neuter through polymers in solution, forming the substantially spherical granules that are generally denominated quick action granules or immediate action granules.

2. Polymers are added to a fraction of the product obtained in the previous stage, which polymers adhere and that come from a solution configuring some spheres of controlled and sustained action of the active principle.

3. Combination, association or blend of the pills emergent from stage 2 with the granules of controlled and sustained action of stage 3. The nodules have a size around 0.2 mm to 1.8 mm preferably around 0.4 mm to 1.5 mm.

[0009] The solutions used for the obtaining of the pills or substantially spherical (or rounded) granules of quick action or release are, for example, acetone, isopropylic alcohol, ethylic alcohol, chloroform, methylene chloride, water or blend of the same and although the present invention does not depend on specific bonding polymers, polyvinylpyrrolidones, polyethylenglycols, methylcelulose, sucrose, jellys, starch and mixtures thereof are preferred.

[0010] In an embodiment of this invention, once the granules of immediate action or release are dry, a fraction of the

same is processed to form a second polymeric coating on the first, to form granules or pills of slow release or action or controlled and sustained action.

[0011] The solvents used in the preparation of one and the other coatings are preferably acetone, isopropylic alcohol, ethylic alcohol or other alcohol, chloroform, methylene chloride, water or a blend thereof.

[0012] The polymers can be such as to form the mentioned coating with whole polymers such as the polymers and copolymers of the methacrylic acid (different types of eudragit L, Eudragit RL or Eudragit RS or combinations among them), cellulose acetophtalate, different types of hydroxipropylmethylcelluloses phtalate, hydroxipropylmethylcelluloses, ethylcelluloses, shellac, etc. these polymers can be combined in different proportions among them.

[0013] It is possible to incorporate diethylphtalate, polyethylenglycol, triethylcitrate, triethylcitrate, triacetine, triglycerics of fatty acids, or other plasticizers and before the drying it the incorporation of lubricant is convenient, just as talc that additionally reduces the agglutination or binding of the particles.

[0014] Preferably, in the second stage (formation of the mentioned coating) the following proportions are recommended:

- Active agents - Bromazepan - the proportion with relation to the total amount of exicipients will be from 0.5 to 15% and that of the exicipients and binding polymers with regard to the rest of materials from 0.5 to 7%.

- According to the invention, it is preferred that the final concentration of the active agent in the pills or granules to be from 0.5 to 14% and that the diameter of those in the order of 0.5 mm to 1.9 mm, preferably between 0.7 mm and 1.8 mm.

- Preferred aspects of the invention, are given by the following ratios: when ethylcelluloses are used, it is advisable a final concentration of up to 50%.

- Solvents used in stages 2 and 3 can be formulated within a wide range of possibilities, extended between the applications of anhydrous solvents and the exclusive application of water.

- The proportion of pills or granules of quick or immediate action of the stage 2 with regard to the final mixture is included between zero and 50% ponderal.

- The pills or granules that contain (7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one) according to the present invention are administrable in different doses, in capsules of hard jelly at concentrations preferably from 1mg to 18 mg.

[0015] These pills or granules are dissolved in a controlled and sustained way and this action can be verified "in vitro" with the team of Breakup type XXIII USP pages 1791 Apparatus II of the palette type at 502 r.p.m. and each glass with 800 ml of artificial gastric juice taking samples in different hourly reactions.

[0016] The breakup profile of these granules of (7-bromo-1,3-dihydro-5-(2-pyridinyl) -2H-1,4-benzodiacepin-2(1H)-one) is the following:

1st. hour	20% - 50%
4th. hour	50 % - 85 %
8th. hour	> 80 %

[0017] In accordance with this invention dosages of (7-bromo-1,3-dihydro-5-(2-pyridinyl) -2H-1,4-benzodiacepin-2(1H)-one) of sustained and controlled action with stable plasmatic levels are obtained.

[0018] In the following illustrative examples, it is demonstrated how the present invention can be carried out.

Example 1

[0019]

Neuter (sugar/starch nodules)	190.0 g.
Polyvinylpyrrolidone	2.8 g.
Polyethylenglycol	3.0 g.
Eudragit L	2.0 g.
Eudragit RL	2.0 g.
Ethylcellulose	3.0 g.
Triethylcitrate	1.0 g.
Bromazepan	6.0 g.
Talc	14.0 g.

1. The active agent is micronized to a size less than 40 microns (10-6 meters).

2. The support material is incorporated under the form of spherical nodules or particles (denominated neuters) into a shallow bowl of stainless steel that rotates at a speed between 7 and 35 r.p.m. and the active agent is incorporated simultaneously, by means of spraying on the same a solution that also contains; polyvinylpyrrolidone, polyethylenglycol in isopropylic alcohol at 10% (solids/liquids p/w).
Once the process is finished the product is allowed to dry off.

3. From the material processed and formed in the stage 2, a 30% ponderal is separated, and the remaining mass (70% ponderal) remains in the shallow bowl and at a speed between 7 and 35 r.p.m. it is treated by spraying with a solution that contains (Eudragit L, Eudragit RL, ethylcellulose triethylcitrate) to 10% p/w dissolved in 90% of a solvent means of 60% isopropylic alcohol, 30% acetone and 10% water.

4. The product obtained from stage 3 is dried up and before being treated with (anti-agglutinant) talc it is blended with the granules remainders from stage 2.

Example 2

[0020]

Neuter (sugar/starch nodules)	205.0 g
Polyvinylpyrrolidone	5.0 g.
Methylcellulose	1.0 g
Cellulose Acetophtalate	1.0 g
Eudragit RS	1.0 g
Ethylcellulose	1.0 g
Diethylphtalate	0.8 g
Bromazepan	6.0 g
Talc	10.0 g

1. The active agent is micronized to a size less than 40 microns.

2. The spheroidal nodules(neuter) are incorporated to a shallow bowl of stainless steel that rotates at a speed between 7 and .35 r.p.m.

The active agent is added simultaneously by spraying on said granules or neuter of a solution of said active agent in a solvent means including: polyvinylpyrrolidone, methylcellulose and cellulose acetophtalate dissolved to 8% p/w of solid/liquid, in a mixture of 90% isopropylic alcohol and 10% water.

Once the process is finished, the resulting product is allowed to dry.

3. From the granules formed and recovered from stage 2, a mass equivalent to 33% is separated, and the remaining 67% is retained in the shallow bowl and at a speed between 7 and 35 r.p.m., it is treated by means of spraying with a solution that contains (Eudragit RS, ethylcellulose, dibuthylphtalate) total 8% p/w dissolved in 92% of a solvent mixture of 55% isopropylic alcohol, 40% acetone and 5% water.

4. The product formed in stage 3 is dried up, and previously treated with talc, and it is blended with the granules formed in the stage 2.

Example 3

[0021]

Neuter (sugar/starch)	186.0 g
Polyvinylpyrrolidone	6.0 g
Eudragit L	6.0 g
Ethylcellulose	4.0 g
Bromazepan	6.0 g
Talc	12.0 g

1. The active agent is micronized to a size less than 40 microns.

2. The nodules are incorporated to a shallow bowl of stainless steel that rotates at a speed between 7 and 35 r.p.m.

The active agent is added simultaneously, by spraying said agent over said granules or neuter in a solvent solution comprising polyvinylpirrolidone, methylcellulose and cellulose acetophtalate dissolved with a proportion of 8 % solid/liquid, in a blend of 90% isopropylic alcohol and 10 % water.

Once the spraying process is finished, the resulting product is allowed to dry.

3. From the granules formed and recovered in the stage 2, a fraction that corresponds to 30% ponderal is separated and the remaining 70% retained in the shallow bowl and at a speed between 7 and 35 r.p.m., is treated by means of spraying with a solution that contains (Eudragit L, ethylcellulose) 10% total p/w dissolved in 90% of a solvent media that includes 60% isopropylic alcohol and 40% acetone.

4. The product formed in the stage 3, previously treated with talc (antiagglutinant) is left to dry and is blended with the remianing granules of stage 2.

Example 4

[0022]

Neuter (sugar/starch)	202.0 g
Polyvinylpyrrolidone	3.0 g
Polyethylenglycol	3.0 g
Hydroxipropylmethylcellulose Phtalate	3.0 g
Ethylcellulose	5.0 g
Triacetine	0.5 g
Bromazepan	6.0 g
Talc	9.0 g

1. The active agent is micronized to a size less than 40 microns

2. The nodules are incorporated to a shallow bowl of stainless steel that rotates at a speed between 7 and 35 r.p.m. and the active agent is incorporated and simultaneously a solution of polyvinylpyrrolidone, polyethylenglycol 9% p/w in a solvent media is added by spraying, said solvent comprising 95% of isopropylic alcohol and 5% water.
Once the process is finished the resulting product is allowed to dry.

3. From the coated granules formed in stage 2, a mass equivalent to 34% of the total is separated and the remaining mass (66% of the total retained in the shallow bowl at a speed between 7 and 35 r.p.m.) is treated by spraying a solution of hydroxipropylmethylcellulose phtalate ethylcellulose and triacetine to 7% in total p/w dissolved in a solvent mixture /93% comprising 80% of isopropanol, 10% of acetone and the rest to a hundred is water.

4. The product formed in the stage 3, is left to dry, being previously treated as in the previous examples with talc and then blended with the remaining mass of granules from stage 2.

Example 5

[0023]

Neuter (sugar/starch)	198.0 g
Polyvinylpyrrolidone	5.0 g
Methylcellulose	1.0 g
Hydroxipropylmethylcellulose	1.0 g
Eudragit L	6.0 g
Ethylcellulose	3.0 g
Polyethylenglycol	0.4 g
Bromazepan	11.0 g
Talc	11.0 g

1. The active agent is micronized to a size less than 40 microns.

2. The spherical nodules (or neuter) are incorporated to a shallow bowl of stainless steel that rotates at a speed between 7 and 35 r.p.m., being simultaneously treated by spraying of a solution of the active agent 8% ponderal with a solution of PVP and methylcellulose - 8% ponderal in a solvent media that sprays a solution on the spheres denominated neutres;said solution including isopropanol, 90% and water 10%.

3. From the dry product formed in the previous stage, an equivalent fraction to 35% ponderal is separated (65%) retained in the shallow bowl and at a speed between 7 and 35% r.p.m. it is treated by spraying a solution of 8% p/w hydroxipropylmethylcelluloses, Eudragit L, ethylcellulose, polyethylenglycol 92% p/w of a solvent mixture that includes 90% isopropanol, 5% water.

4. The product formed and recovered in the stage 3 is dried, being previously treated as in the previous examples with talc and being blended with the remainder mass separated in stage 2.

[0024] With the samples taken in these examples the tests of dissolution of the granules according to USP XXIII blades method was carried out with 800 ml of artificial gastric juice in each glass and at 50 r.p.m. with samples taken at certain intervals (column 1). The results are illustrated in the following chart:

Percentage of Release					
Hs.	Example 1	Example 2	Example 3	Example 4	Example 5
1	31%	35%	30%	37%	35%
4	72%	74%	68%	72%	71 %
8	91%	94%	90%	96%	95%

[0025] Although in the present invention a reference is made to the nodules or nuclei formed by sugar/starch (that is to say nodules formed by a coherent mass of particles of sugar agglutinated with starch) it must be born in mind that other compounds may be applied to formulate said nuclei subject to the condition of pharmaceutically acceptable: other mono or polysacharids, natural gums and in the case of insuline-dependent patients, lipids or proteins.

[0026] On the other hand, the pills or granules to form the compositions of the present invention can be formulated with granules of quick release and granules of sustained release, formed sequentially or formulated with granules of one and the other type prepared separatedly, stored and then gathered "in situ", given the case of being used independently and according to the clinical decision of the case.

Pharmacokinetic study

[0027] In accordance with the previously described and the present examples, capsules that contained 9 mg of 7-bromo-1,3-dihydro-5-(2-pyridinyl) -2H-1,4-benzodiacepin-2(1H-ona) of sustained and controlled action were presented and comparative studies with capsules that contained 3mg of 7-bromo-1,3dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one) and with capsules that contained 1,5 mg of 7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2-(1H)-one) were carried out.

[0028] The studies were carried out with 10 healthy volunteers and was administered oral via. The method was crossed with a washing time of 2 weeks between each formulation. The plastic concentrations were analyzed and the statistical study of the parameters was evaluated.

[0029] The products are defined as follows:

LC 3mg: Capsules of conventional or immediate action that contain 3 mg of 7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one).

LP 9mg: Capsules with granules or pills of controlled and sustained action that contain 7-bromo-1,3-dihydro-5-(2-pyrinyl)-2H-1,4-benzodiacepin-2(1H)-one)

LC 1,5 mg: Capsules of conventional or immediate action that contain 1,5 mg of 7-bromo-1,3-dihydro-5-(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one).

[0030] The administration is defined in the following way:

Formulation	Dose	Number
LC 3mg	3mg.	1
LP 9mg.	9 mg.	1
LC 1,5 mg	1,5 mg	6 (1 every 90 min.)

[0031] The characteristics associated with the formulation LP 9 mg in relation with Lc 3 mg and LC 1,5 mg 6 intakes 1 every 90 min. are the following:

[0032] The product LP 9 mg has stable plasmatic levels in form of plateau between the 2nd. and 12th. hour with a TMAX at the 8th hour and with active values at 24 hours and if we compare with product LC 1,5 mg 6 intakes 1 every 90 min. it has a Tmax a Cmax and AUC with non significant differences among them and with a similar plateau between the 6th and 12th hours and similar values at 24 hours.

[0033] With regard to the formulation LC 3mg the AUC is approximately three times but this product has a Tmax and a Cmax at first hour and starting from this some descending and not very significant levels at 24 hours.

[0034] Therefore the product LP 9mg. is defined as of controlled and sustained action showing a displacement of the Tmax and Cmax with regard to the LC 3mg, but a triple AUC; at the same time being similar to the AUC, TMX and Cmax of the LC 1,5 mg 6 intakes at a rate of 1 each 90 ′ and concentrations stable in the following intervals.

[0035] Table 1 shows the parameters of LC 3 mg, LP 9 mg and LC 1,5 mg 6 intakes 1 every 90 min., and the average concentrations in time on 10 volunteers.

Table 1

Formulation/Parameters	Cmax (ng/ml)	Tmax (hours)	Auc 0-24 (ng.h/ml)
LC 3 mg	38.1	1	320.8
LP 9 mg	48.0	8	961.3
LC 1,5 mg 6 takings 1 per 90 ′	50.0	8	929.5

[0036] Having thus specially described and determined the nature of the present invention, and how it can be carried out, the following is claimed as of exclusive right and property:

Claims

1. Procedure to form pharmaceutical compositions in substantially spherical pills or granules of controlled qand sustained action that contain as active agent 7 bromo-1,3-dihydro-5-(2-pyridinil)-2H-1,4-benzodiacepin-2(1H)-one), characterized because it comprises the following stages:

   a) a coating of nodules or nuclei formed by particles of sugar consolidated with starch, in an operation of blending of said nodules with micronized Bromazepan and a bonding polymer in solution, to form a biodegradable coating on said nodules, which retains the micronized material, forming the group of coated nodules, a first formulation, of quick release of Bromazepan;
   b) forming on at least one separated fraction of the released nodules coming from stage a), a second coating, in an operation of blending of said fraction with a film-forming eutherical polymer in solution forming said fraction provided of this euterical coating in solution, a second formulation, of slow release;
   c) combining enough quantities of formulations of Bromazepan of quick release and of slow or sustained release formed in the stages a) and b), to form compositions that contain predetermined doses and of programmed release of Bromazepan.

2. Procedure in accordance with claim 1, characterized in that he active agent is micronized to a size less than 40 microns.

3. Procedure in accordance with claim 1, characterized in that the nodules or nuclei have a diameter from 0,2 to 1,8

mm preferably between 0,4 to 1,5 mm.

4. Procedure in accordance with claim 1, characterizedw in that the bonding polymers that form the first coating are selected among polyvinylpyrrolidones CPVP polyethylenglycols, methylcellulose, sacarose, jelly, starch and combinations thereof.

5. Procedure in accordance with claim 1, characterized in that the polymers forming the second coating, with polymers of euterical dissolution such as polymers and copolymers of esthers of methacrylic acid cellulose acetophtalate, hydroxipropylmethylcellulose phtalate of hydroxipropylmethylcellulose or shellac and combinations thereof.

6. Procedure in accordance with claim 1, characterized in that the percentage of nodules of quick action in combination with the nodules of controlled and sustained action is from 0% to 50%.

7. Procedure in accordance with claim 1, characterized in that the solvents used in stages a) and b) are chosen among acetone, isopropylic alcohol, ethylic alcohol, chloroform, methylene chloride, water or combinations thereof.

8. Procedure in accordance with claim 1, characterized in that the solution contains plasticizers such as diethylphtalate, dibutylphtalate triacetine triethylcitrate triglicerids of fatty acids, alone or a combination thereof

9. Procedure in accordance with claims 1 characterized in that the proportion of active agent with regard to the rest of the excipients is from 0,5% to 15%.

10. Procedure in accordance with claims 1 and 2 characterized in that the proportion of bonding polymers with regard to the remaining components is from 0,5 to 7%.

11. Procedure in accordance with claims 1 and 2 characterized in that the ethylcellulose proportion in the final concentration is from 0% to 50%.

12. Procedure in accordance with claims 1 and characterized in that the final concentration of active agent in the nodules is from 0,5% to 14%.

13. Procedure in accordance with claims 1 and 2 characterized in that the final size of the granules is from 0,6 mm to 2 mm preferably between 0,8 mm to 1,7 mm.

14. Procedure in accordance with claims 1 and 2 characterized in that the preparations for the administration of the nodules of controlled and sustained action in capsules of hard jelly, in different concentrations of the active agent 7-bromo-1,3-dihydro-5(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one), are obtained preferably between 1 mg to 18 mg.

15. Procedure in accordance with claim 1 characterized in that the dissolution of the nodules "in vitro" according to the dissolution apparatusUSP XXIII blade type with 800 ml of artificial gastric juice at 50 r.p.m. and at 37° corresponds with this profile:

1st. hour—20% - 50%
4th. hour—50% - 85%
8th. hour— > 80%.

16. Procedure in accordance with claims 1 and 2, characterized in that the nodules of extended and sustained action obtained, maintain plasmatic concentrations Cmax and Tmax as compared with the conventional administration in a single intake and at the same time similar concentrations to a same doses of the administration in form of conventional action in repeated numbers; therefore the spheres showing a controlled and sustained active action 7-bromo-1,3-dihydro-5(2-pyridini)-2H-1,4-benzodiacepin-2(1H)-one).

17. Pharmaceutical compositions in substantially spherical pills or granules, with controlled and sustained release of 7-bromo-1,3-dihydro-5(2-pyridini)-2H-1,4-benzodiacepin-2(1H)-one) as active agent, resulting from the procedure of claim 1, characterized in that they include predetermined proportions of substantially spherical pills or granules of:

i) a new formulation of quick release including nodules or nuclei formed by particles of sugar consolidated with starch coated with a biodegradable coating formed by a film-forming bonding polymer and fixed on these nodules that includes the micronized active agent;

ii) a second formulation of slow release including said nodules or coated nuclei, provided with a second coating, formed by an film-forming eutheric polymer and fixed on the same coating, the relationship between the first one and second formulation in both compositions being selected for predetermined doses and of programmed release of Bromazepan.

18. Pharmaceutical compositions in accordance with claim 17, characterized in that the active agent is micronized to a size of less than 40 microns.

19. Pharmaceutical compositions in accordance with claim 17, characterized in that the nodules or nuclei have a diameter from 0,2 to 1,8 mm preferably between 0,4 to 1,5 mm.

20. Pharmaceutical compositions in accordance with claim 17, characterized in that the bonding polymers that form the first coating are selected from polyvinylpyrrolidones CPVP polyethylenglycols, methylcellulose, sucrose, jelly, starch and combinations thereof.

21. Pharmaceutical compositions in accordance with claim 17, characterized in that the polymers form the second coating, with polymers of euteric dissolution such as polymers and copolímeros of esthers of methacrylic acid cellulose acetophtalate, hydroxipropylmethylcelulose phtalate of hydroxipropylmethylcellulose or shellac and combinations thereof.

22. Pharmaceutical compositions in accordance with claim 17, characterized in that the percentage of nodules of quick action in the combination with the nodules of controlled and sustained action is from 0% to 50%.

23. Pharmaceutical compositions in accordance with claim 17, characterized in that the solvents used in the stages a) and b) are chosen from acetone, isopropylic alcohol, ethylic alcohol, chloroform, methylene chloride, water or combinations thereof.

24. Pharmaceutical compositions in accordance with claim 17, characterized in that the solution contains plasticizers such as diethylphtalate, dibutylphtalate triacetine triethylcitrate triglicerids of fatty acids, alone or a combination thereof.

25. Pharmaceutical compositions in accordance with claim 17, characterized in that the proportion of active agent with regard to the rest of the excipients is from 0,5% to 15%.

26. Pharmaceutical compositions in accordance with claim 17, characterized in that the proportion of bonding polymers with respect to the remaining components is from 0,5 to 7%.

27. Pharmaceutical compositions in accordance with claim 17, characterized in that the proportion of ethylcellulose in the final concentration is from 0% to 50%.

28. Pharmaceutical compositions in accordance with claim 17, characterized in that the final concentration of the active agent in the nodules is from 0,5% to 14%.

29. Pharmaceutical compositions in accordance with claim 17, characterized in that the final size of the granules is from 0,6 mm to 2 mm, preferably between 0,8 mm and 1,7 mm.

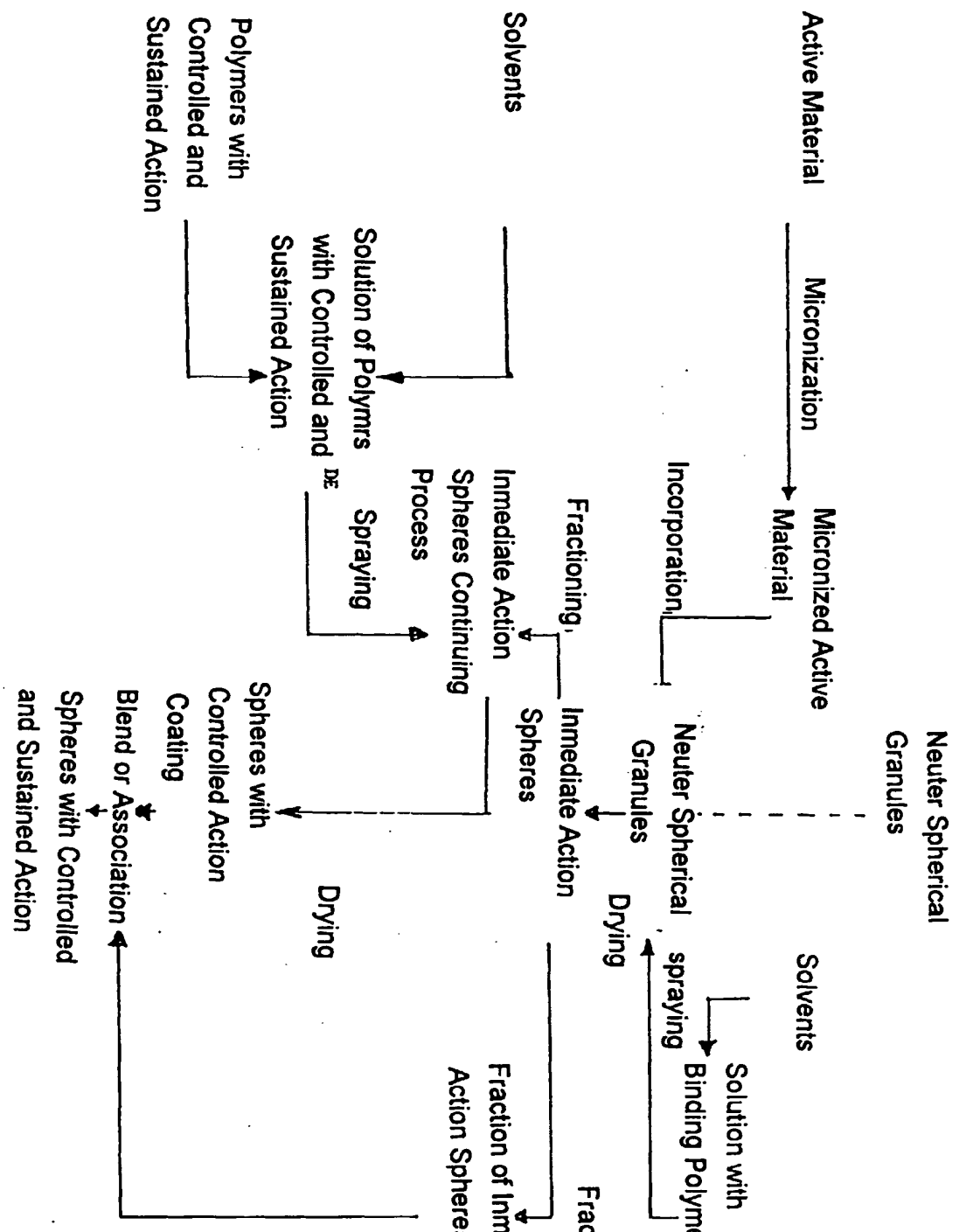
30. Pharmaceutical compositions in accordance with claim 17, characterized in that they include preparations for the administration of the nodules of controlled and sustained action in capsules of hard jelly, in the different concentrations of the active agent 7-bromo-1,3-dihydro-5(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one), preferably among 1 mg to 18mg.

31. Pharmaceutical compositions in accordance with claim 17, characterized in that the dissolution of the nodules "in vitro" according to the breakup apparatus USP XXIII of blade type with 800 ml of artificial gastric juice at 50 r.p.m. and at 37° corresponding with this profile:

1st. hour 20% - 50%
4th. hour 50% - 85%
8th. hour > 80%.

32. Pharmaceutical compositions in accordance with claim 17, characterized in that the nodules of extended and sustained action obtained, keep plasmatic concentrations Cmax and Tmax in comparison with the conventional administration in a single intake and at the same time similar concentrations to same dosage of the administration in form of conventional action in repeated intakes; the spheres therefore showing a controlled and sustained action of active matter 7-bromo-1,3-dihydro-5(2-pyridini)-2H-1,4-benzodiacepin-2(1H)-one).

Procedure to form pharmaceutical compositions in substantially spherical pills or granules with controlled and sustained action, having the 7-bromo-1,3-dihydro-5(2-pyridinyl)-2H-1,4-benzodiacepin-2(1H)-one), as active agent, and to pharmaceutical compositions obtained thrugh such procedure.



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EUROPEAN SEARCH REPORT

Application Number
EP 98 50 0202

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 335 560 A (TANABE SEIYAKU CO) 4 October 1989 * page 7; example 3 * ---	1-32	A61K9/50 A61K31/55
A	US 3 864 486 A (BLUM JOHANNES ERNST) 4 February 1975 * column 5; example 3 * ---	1-32	
A	DE 34 30 389 A (KOPF ROLAND) 27 February 1986 * page 11, line 6 - line 14 * * page 13; example 2 * -----	1-32	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A61K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 February 1999	Boulois, D

CATEGORY OF CITED DOCUMENTS

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08-02-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0335560 A	04-10-1989	AU 3227389 A	05-10-1989
		BG 50712 A	15-10-1992
		CA 1339078 A	29-07-1997
		DE 68907762 T	11-11-1993
		DK 156289 A	01-10-1989
		ES 2059729 T	16-11-1994
		FI 891163 A	01-10-1989
		FR 2629344 A	06-10-1989
		HK 76195 A	26-05-1995
		IE 64348 B	26-07-1995
		JP 2001405 A	05-01-1990
		JP 7091184 B	04-10-1995
		KR 9507202 B	04-07-1995
		NO 178136 B	23-10-1995
		PH 25791 A	05-11-1991
		PT 90153 A,B	10-11-1989
		SU 1836083 A	23-08-1993
		US 5068112 A	26-11-1991
		US 5254347 A	19-10-1993
US 3864486 A	04-02-1975	AU 471785 B	06-05-1976
		AU 5944773 A	27-02-1975
		BE 805055 A	20-03-1974
		CA 1004597 A	01-02-1977
		DD 113438 A	12-06-1975
		DE 2342214 A	28-03-1974
		FR 2199992 A	19-04-1974
		GB 1393226 A	07-05-1975
		LU 68442 A	21-05-1975
		NL 7312363 A,B,	25-03-1974
		SE 423594 B	17-05-1982
		ZA 7305524 A	31-07-1974
DE 3430389 A	27-02-1986	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82